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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,292	09/30/2003	Hiroyuki Urushiya	03560.003367	1583

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FITZPATRICK CELLA HARPER & SCINTO  
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NEW YORK, NY 10112

EXAMINER
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GE, YUZHEN

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/12/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/673,292

Applicant(s)

URUSHIYA, HIROYUKI

Examiner

Yuzhen Ge

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☒ Claim(s) 4, 9, 11/4, 12/9, 13/9 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application.
- 6) ☐ Other: \_\_\_\_.

Continuation of Disposition of Claims: Claims rejected are 1-3, 5-8, 10, 11/1-11/3, 11/5, 12/6-12/8, 12/10, 13/6-13/8 and 13/10.

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 101***

Claims 12/6-12/10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 12/6-10 define a program embodying functional descriptive material. However, the claim does not define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). That is, the scope of the presently claimed program can range from paper on which the program is written, to a program simply contemplated and memorized by a person. The examiner suggests amending the claim to embody the program on "computer-readable medium" or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure. Because claims 13/6-12/10 already define a computer readable storage medium, the examiner suggests canceling claims 12/6-12/10.

Claims 11 and 13 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility states in page 53 that "A claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the

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computer which permit the computer program's functionality to be realized, and is thus statutory." However, Claims 11 and 13 do not recite explicitly "a computer-readable medium encoded with a computer program". The recitation of "an article comprising computer memory encoded with a program" may include other nonstatutory subject matters. Currently in TC 2600, it is required explicitly to include "computer-readable medium", "encoded" (or "storing", "embodied with a", "encoded with a", "having a stored", "having an encoded"), and "computer program" in the claim language to make it explicitly a statutory subject matter. The examiner suggests rewording "a computer readable storage medium storing a program for ..." to "a computer readable storage medium storing a computer program for..."

***Claim Rejections - 35 USC § 102***

2. Claims 1-2, 6-7, 11/1-11/2, 12/6-12/7, and 13/6-13/7 are rejected under 35 U.S.C. 102(b) as being anticipated by Inoue et al (EP 0905650 A2, cited by IDS).

Regarding claim 1, Inoue et al teach an image processing apparatus for performing gradation conversion processing for an object image (Figs. 3-5), said apparatus comprising:

determination means for determining variables for specifying a gradation conversion function, from a relationship between the variables and a processed image obtained by performing gradation conversion processing for the object image with the gradation conversion function (paragraphs [0093-0095], [0097-0102], abstract, for examples,  $x$ ,  $H(x)$  are variables, the standard image is a processed image, Figs. 6 and 9, the gradation conversion function is for the object image); and

gradation conversion means for performing gradation conversion processing for the object image with the gradation conversion function specified by the variables determined by said determination means (paragraphs [0095]-[0096], [0097-0102], Figs. 8 and 9, abstract).

Regarding claim 2, Inoue et al teach an image processing apparatus according to claim 1, wherein said determination means determines the variables so that flatness of a histogram of the processed image is maximized (Fig. 9, the flatness of the histogram of the processed image shown in Fig. 9(c) is maximized).

Claims 6-7 are the corresponding method claims of claims 1-2. Inoue et al teach a method (Figs. 6, 8 and 11, title and abstract). Thus Inoue et al teach claims 6-7 as evidently explained in the above-cited passages.

Claims 11/1-11/2 and 13/6-13/7 are the corresponding computer readable medium claims of claims 1-2 and 6-7. Inoue et al teach a computer readable medium (Fig. 1, paragraph [0009]). Thus Inoue et al teach claims 11/1-11/2 and 13/6-13/7 as evidently explained in the above-cited passages.

Claims 12/6-12/7 are the corresponding computer program claims of claims 6-7. Inoue et al teach a computer program (Fig. 1, paragraph [0009]). Thus Inoue et al teach claims 12/6-12/7 as evidently explained in the above-cited passages.

***Claim Rejections - 35 USC § 102***

3. Claims 1-3, 5-8, 10, 11/1-11/3, 11/5, 12/6-12/8, 12/10, 13/6-13/8 and 13/10 are rejected under 35 U.S.C. 102(b) as being anticipated by Ajewole et al (US Patent 5,046,118).

Regarding claim 1, Ajewole et al teach an image processing apparatus for performing gradation conversion processing for an object image (Figs. 3-5), said apparatus comprising:

determination means for determining variables for specifying a gradation conversion function, from a relationship between the variables and a processed image obtained by performing gradation conversion processing for the object image with the gradation conversion function (Figs. 4-8, col. 5, lines 21-58, col. 6, lines 35-57, abstract, for examples,  $X_B$  are variables, the image with model uniform distribution is a processed image, the gradation conversion function is for the object/input image, col. 8, lines 30-36); and

gradation conversion means for performing gradation conversion processing for the object image with the gradation conversion function specified by the variables determined by said determination means (Figs. 4 and 9-10, col. 6, lines 34-57, col. 8, lines 30-66).

Regarding claim 2, Inoue et al teach an image processing apparatus according to claim 1, wherein said determination means determines the variables so that flatness of a histogram of the processed image is maximized (col. 4, lines 59-65, col. 6, lines 23-40).

Regarding claim 3, Ajewole et al teach an image processing apparatus according to claim 1, wherein said determination means determines the variables so that a mean square error between

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pixel values of the processed image and a flat pixel-value histogram of the processed image is minimized (col. 6, lines 34-40).

Regarding claim 5, Ajewole et al teach an image processing apparatus according to claim 1, wherein the variables are restricted so that the characteristics of the gradation conversion function vary only within a range equivalent to a characteristic curve of a film (col. 1, lines 11-47).

Claims 6-8, and 10 are the corresponding method claims of claims 1-3 and 5. Ajewole et al teach a method (Figs. 4-10, title and abstract). Thus Ajewole et al teach claims 6-8 and 10 as evidently explained in the above-cited passages.

Claims 11/1-11/3, 11/5, 13/6-13/8 and 13/10 are the corresponding computer readable medium claims of claims 1-3, 5-8, and 10. Ajewole et al teach a computer readable medium (abstract, Fig. 1). Thus Ajewole et al teach claims 11/1-11/3, 11/5, 13/6-13/8 and 13/10 as evidently explained in the above-cited passages.

Claim 12/6-12/8 and 12/10 are the corresponding computer program claims of claims 6-8 and 10. Ajewole et al teach a computer program (Fig. 1, abstract). Thus Ajewole et al teach claim 12/6-12/8 and 12/10 as evidently explained in the above-cited passages.



***Claim Rejections - 35 USC § 103***

4. Claims 3, 5, 8, 10, 11/3, 11/5, 12/8, 12/10, 13/8 and 13/10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al in view of Ajewole et al (US Patent 5,046,118).

Regarding claim 3, Inoue et al teach an image processing apparatus according to claim 1. However they do not explicitly teach wherein said determination means determines the variables so that a mean square error between pixel values of the processed image and a flat pixel-value histogram of the processed image is minimized. In the same field of endeavor, Ajewole et al teach to minimize the mean square error between an image and the model uniform distribution/flat histogram of the image (col. 6, lines 35-40). It is desirable to have an ideal histogram of an after gradation correction to produce high quality images (col. 6, lines 24-29, col. 1, lines 24-47 of Ajewole et al). Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to use the method of Ajewole et al in the apparatus of Inoue et al to determine the variables for gradation conversion so that the mean square error between pixel values of the processed image and a flat pixel-value histogram of the processed image is minimized to achieve high image quality.

Regarding claim 5, Inoue et al teach an image processing apparatus according to claim 1. They also teach wherein the variables for identifying the gradation conversion function are restricted (paragraphs [0071], [0097-0102], Figs. 6 and 8-9, the variables x, M0, M1). However they do not explicitly teach the variables are restricted so that the characteristics of the gradation conversion function vary only within a range equivalent to a characteristic curve of a film. In

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the same field of endeavor, Ajewole et al teach that the any x-ray imaging system must be able to produce an output from the digital signals in the form of a visible image on output medium such as film and also input that is scanned to generate the digital signals may be film (col. 1, lines 11-24). Ajewole et al also teach the input grey level distribution must be optimally transformed to fit the available output range while at the same time producing a high quality image (col. 1, lines 24-47). When the digital image is to be output to a film, the variables must be restricted to the range equivalent to a characteristics curve of a film. It is desirable to produce high quality image (col. 1, lines 11-47 of Ajewole et al). Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to use the method of Ajewole et al to restrict the variables of Inoue et al so that the characteristics of the gradation conversion function vary only within a range equivalent to a characteristic curve of a film to produce high quality image on a film or from a film.

Claims 8 and 10 are the corresponding method claims of claims 3 and 5. Inoue et al teach a method (Figs. 6, 8 and 11, title and abstract). Thus Inoue et al teach claims 8 and 10 as evidently explained in the above-cited passages.

Claims 11/3, 11/5, 13/8 and 13/10 are the corresponding computer readable medium claims of claims 3, 5, 8 and 10. Inoue et al teach a computer readable medium (Fig. 1, paragraph [0009]). Thus Inoue et al teach claims 11/3, 11/5, 13/8, and 13/10 as evidently explained in the above-cited passages.

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Claims 12/8 and 12/10 are the corresponding computer program claims of claims 8 and 10.

Inoue et al teach a computer program (Fig. 1, paragraph [0009]). Thus Inoue et al teach claims 12/8 and 12/10 as evidently explained in the above-cited passages.

5. Claims 5, 11/5, 10, 12/10, and 13/10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al in view of Bell et al (US Patent 6,370,265 B1, cited by IDS).

Regarding claims 5, 10, 11/5, 12/10 and 13/10, Inoue et al teach an image processing apparatus, method, computer readable medium, program according to claims 1, 6, 11/1, 12/6 and 13/6.

They also teach wherein the variables for identifying the gradation conversion function are restricted (paragraphs [0071], [0097-0102], Figs. 6 and 8-9, the variables x, M0, M1). However they do not explicitly teach the variables are restricted so that the characteristics of the gradation conversion function vary only within a range equivalent to a characteristic curve of a film. In the same field of endeavor, Bell et al teach the variables for identifying the gradation conversion function are restricted so that the characteristics of the gradation conversion function vary only within a range equivalent to a characteristic curve of a film (col. 4, lines 3-17). It is desirable to display X-ray digital images to simulate the visual appearance of a traditional radiogram while controlling contrast and brightness (col. 3, line 55-col. 4, line 15 of Bell et al). Therefore it would have been obvious to one of ordinary skill in the art, at the time of invention, to use the method of Bell et al to restrict the variables of Inoue et al so that the characteristics of the gradation conversion function vary only within a range equivalent to a characteristic curve of a film to simulate visual appearance of a traditional radiogram with high image quality.

*Allowable Subject Matter*

Claims 4 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter. The prior art fails to teach the listed claims each of which specifically comprises the following listed feature(s) in combination with other limitations in the respective claims:

-- index calculation means for calculating an index from the histogram obtained by said histogram forming means and an average number of pixels of the object image

*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yuzhen Ge whose telephone number is 571-272 7636. The examiner can normally be reached on 7:30am-4:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Yuzhen Ge  
Examiner  
Art Unit 2624

WENPENG CHEN  
PRIMARY EXAMINER



2/22/07